be settled by the process of elimination unless we agree beforehand as to whether *Flesus* is a valid genus, or as to what were the unexpressed purposes of Rafinesque.

But common usage and common sense agree in placing *platessa*, the common Plaice, as the type of *Pleuronectes*.

DAVID STARR JORDAN.

AN INTERESTING CRETACEOUS CHIMÆROID EGG-CASE.

ALMOST nothing is known of the structural characteristics of the holocephalous fishes of the Mesozoic period except dental plates or teeth. The remains of such, however, are numerous and about a score of generic names have been proposed for them, although A. Smith Woodward only fully recognizes five, *Ganodus, Ischyodus, Edaphodon, Callorhynchus* and *Elasmodectes*. I was, therefore, much interested in a fossil which Drs. Frank H. Knowlton and T. W. Stanton referred to me for identification, if possible, and which I at once recognized as a chimæroid ovicapsule apparently most nearly resembling that of modern deep-sea forms.

The interest arises from the assumption that where likeness prevails between such products, not only the parts which frame them but other structures must correspond. The inference is not irrefragable, but in the absence of contradictory data, perfectly legitimate as a provisional hypothesis at least.

The fossilized egg-cases previously known are few and the indications as to affinities interesting as well as important. Three figures have been published of Jurassic egg-cases, two by Emil Bessels and one by Otto Jaekel. All are of the *Callorhynchus* type and it is significant that a 'right palatine tooth,' obtained from the 'Lower Greensand' of New Zealand, has been attributed by E. T. Newton and Woodward to that genus and named *Callorhynchus hectori*.

The newly found fossil was obtained by Mr. N. H. Darton, of the U. S. Geological Survey, from 'massive sandstone' a few miles west of Laramie, Wyoming.

The contour and general form are well preserved but not the details. The resemblance to the ovicapsules of *Harriotta* and *Rhinochimæra* lies in the absence of differentiation between the anterior and posterior portions of the lateral alæ of the capsule and the uniformity of the transverse costal ridges all through. It differs from the ovicapsules of both *Harriotta* and *Rhinochimæra* by the greater width of the alæ and especially the greater width and extension forward along the sides of the archidome.[1] The resemblance is greatest to *Rhinochimæra*.

The genus *Harriotta* was set apart as the type of a subfamily (Harriottinæ) by Gill, in 1896, and it was associated with *Rhinochimæra* in a family (Rhinochimæridæ) by Garman, in 1904. It is to this group (if a family, properly nameable Harriottidæ) that the Wyoming fossil belongs. It can not be correlated with any one of the many generic names (*Eumylodus, Mylognathus, Dipristis, Sphagepœa, Diphrissa, Bryactinus, Isotænia* and *Leptomylus*) that have been especially coined for American Cretaceous fossils, but the naming of it, if such must be done, I leave to Dr. Dean who is now publishing (through the Carnegie Institution) an elaborate work on the chimæroids. I have had the privilege of looking over the proof-sheets of that work and my knowledge of the ovicapsules of the Harriottidæ is chiefly derived from it, though I had long ago seen those of *Harriotta*.

If these determinations prove correct and the groups named families by Garman are accepted as such the curious deduction follows that no fossil ovicapsule of a typical chimærid has been found as yet.

Although the living harriottids are deep-sea forms, it does not follow that a deep sea is indicated for the habitat of the extinct harriottid. The character of the sandstone as well as of the basin in which the ovicapsule was found is opposed to the hypothesis of a deep sea. It must be remembered, too, that the same genus may have species ranging from shallow water to abyssal depths; *Chimæra*, for example, has a species (*C. colliei*) which may be caught from a city wharf and

[1] In the interest of conciseness of description I would use *archidome* for the chamber for the head and trunk of the chimæroid and *urodome* for that receiving the caudal portion.

another (*C. affinis*) which may descend to a depth of at least 1,300 fathoms.

THEO. GILL.

ELECTROMETER FOR THE STAGE OF THE MICROSCOPE.

THE capillary electrometer consists of a vertical tube drawn out at the lower end into a fine capillary and filled with mercury (Figs. 1 and 2). The upper end of the tube is joined to a cylinder in which a piston is

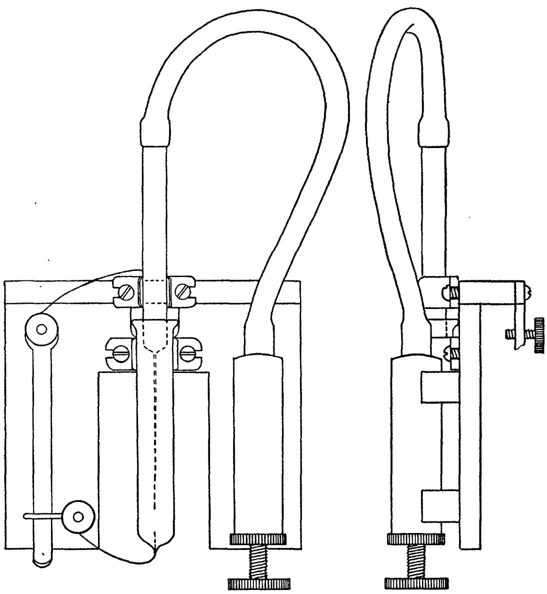

FIG. 1. FIG. 2.

moved by a screw, thus making pressure on the mercury column. The end of the capillary dips in a reservoir containing 20 per cent. sulphuric acid. A little mercury is placed in the reservoir. Platinum wires lead from this and the mercury in the capillary to convenient binding posts. When mercury is placed in the vertical tube it enters the capillary until the weight of the column of mercury is balanced by the surface tension. If the capillary be now dipped in the reservoir containing the sulphuric acid and the piston driven upward by its screw, mercury will be forced out of the capillary into the acid, and on lowering the pressure the mercury will retreat within the capillary, drawing the acid after it. As the mercury in the capillary is kept from falling by the surface tension, it is obvious that whatever increases or diminishes the surface tension, for example an electric current, will raise or lower in corresponding measure the mercury in the capillary. The alteration in surface tension is accompanied by the movement of ions between the meniscus and the remaining electrode of the electrometer (the mercury in the acid reservoir). In practise it is found that this movement can be neither very rapid nor long continued, without injuring the sensitiveness of the instrument. The potential difference from even a single element (Daniell or dry cell) is far too large to be used safely. It is advisable to employ a potential divider, or rheochord, which shall permit only a fraction of the original potential (not more than 0.1 volt) to reach the electrometer.

The electrometer should be kept short-circuited, except during an observation, so that the capillary and the mercury in the reservoir may always be connected through a conductor. The short-circuit key is shown in Fig. 1. A strip of spring brass connected with one of the binding posts of the electrometer rests against a second piece of brass connected with the other binding post, except when depressed by the finger. The point of higher potential, when known, should always be connected with the capillary.

When the capillary electrometer is connected with two points of unlike potential the meniscus is displaced. The pressure necessary to bring it back to its original position is proportional to the electromotive force that displaced the meniscus. Thus by connecting the electrometer with known differences of potential it may be experimentally graduated. In practise, the relation between the pressure and the potential must frequently be redetermined. It is usually easier to measure differences of potential, such as the demarcation current of nerve or muscle, by compensation. In this method the electromotive force of the demarcation current is measured in fractions of a Daniell cell, or any other constant element, by bringing into the same cir-